Cancer Care Ontario

# Radiation Treatment Quality Based Procedures (RT-QBP)

## Genitourinary (GU) Working Group Meeting

**SEPTEMBER 24, 2018**

Ontario
Cancer Care Ontario

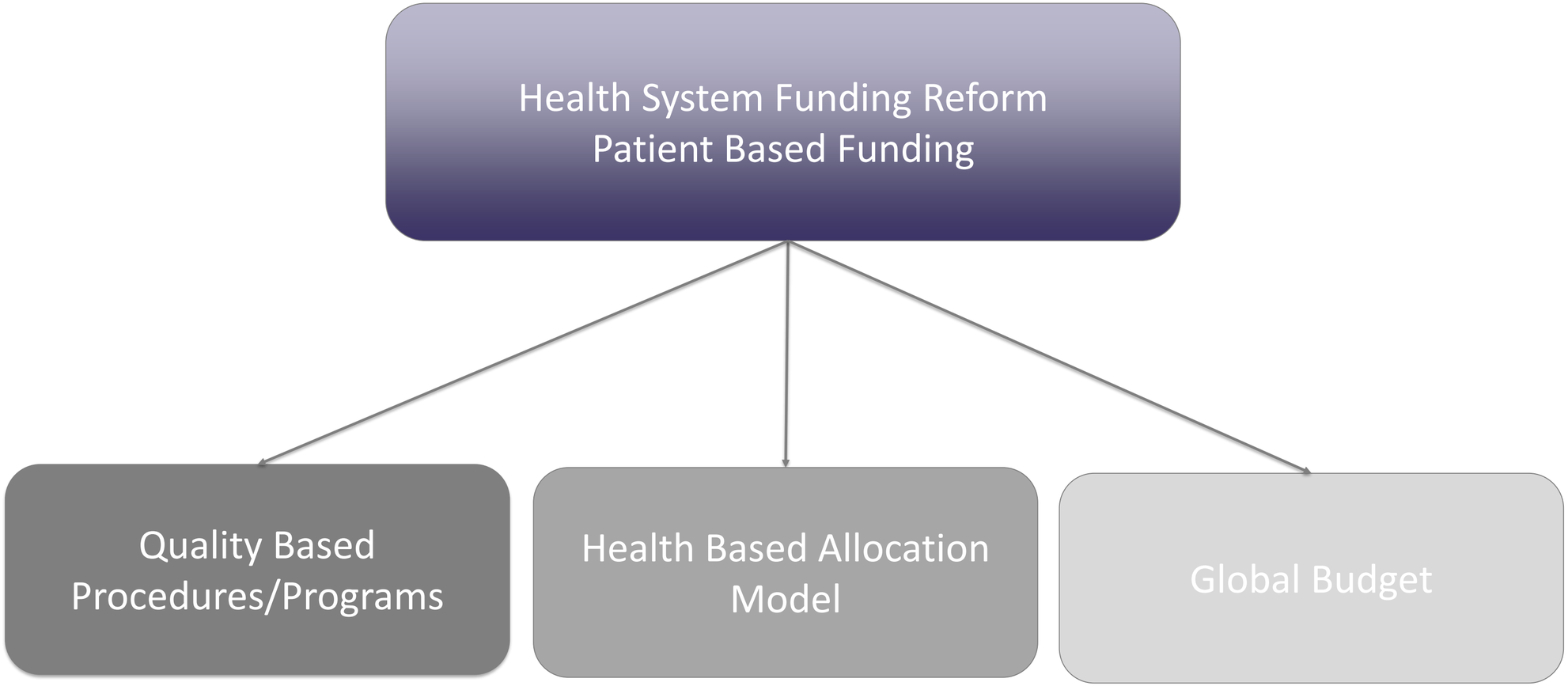
# Objectives for Today

## RT-QBP Advisory Committee meeting:

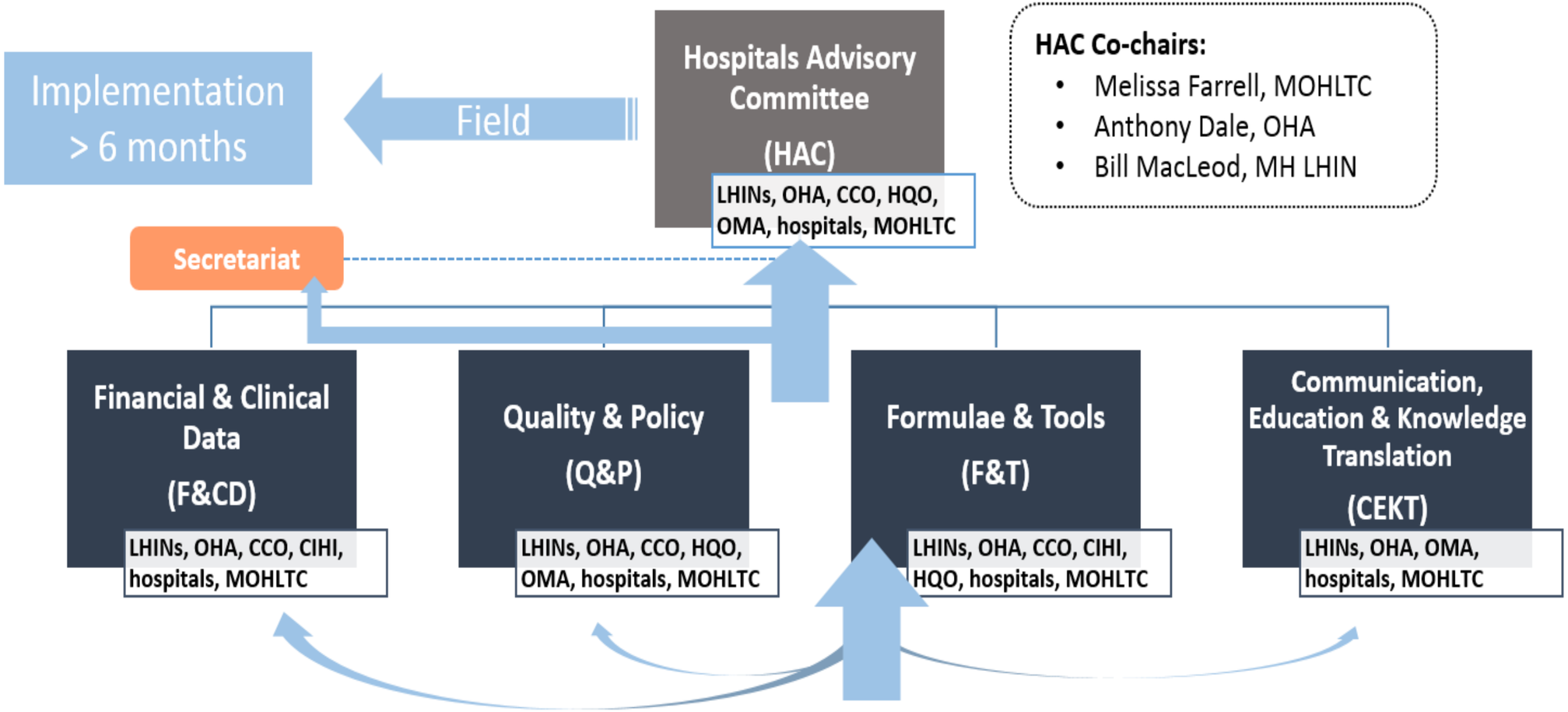
- To provide an introduction to Health System Funding Reform (HSFR)
- To review GU RT-QBP protocols for consideration
- To review GU RT-QBP quality metrics for consideration
- To review the funding approach
- To provide an update on Psychosocial Oncology (PSO)
- Next steps and action items

# Introduction to Health System Funding Reform (HSFR)

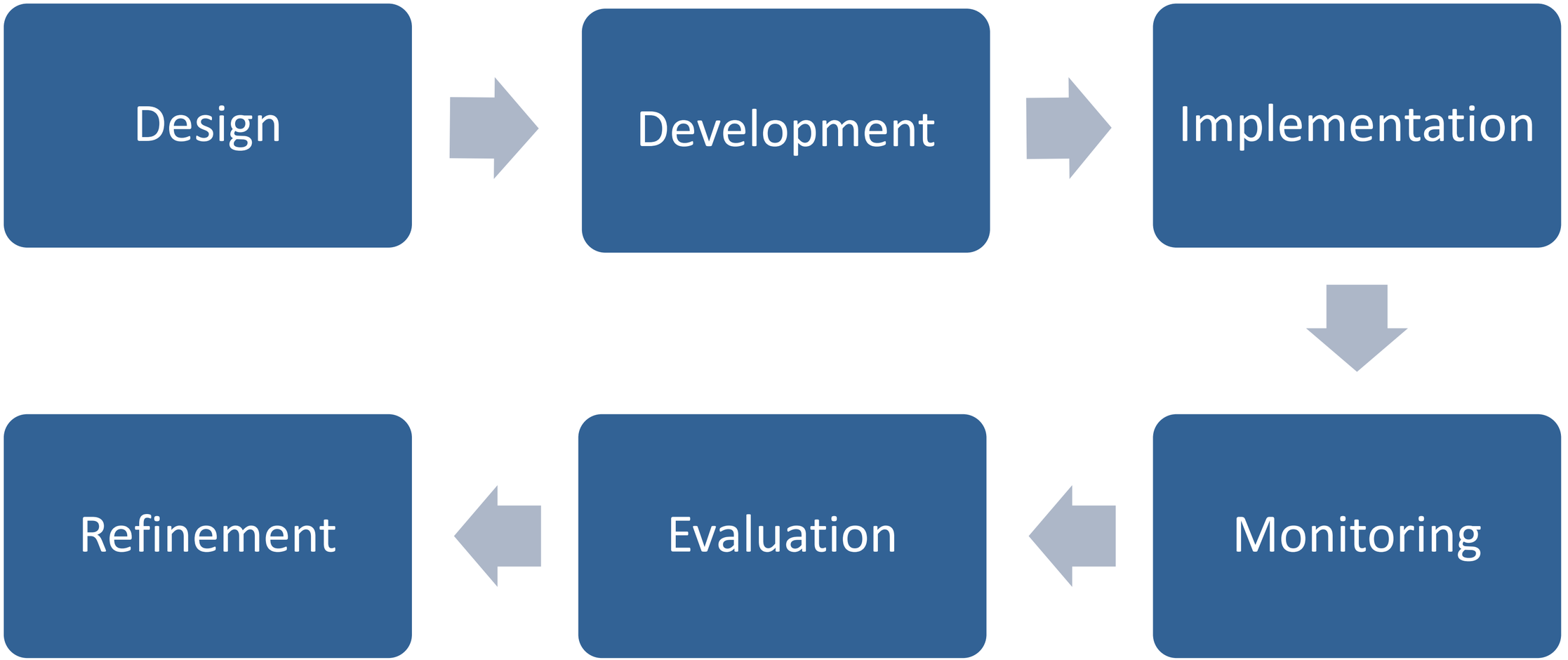
# Health System Funding Reform (HSFR)



# HSFR Governance- Current



# Path to a QBP- Life Cycle



# Path to a QBP- Development & Implementation Activities


**Hospital & Stakeholder Engagement & Knowledge Transfer**

**Health System Funding Reform Governance**



***Note: Scope for other QBP attached in Appendix***

# Radiation Treatment Overview

# Radiation Treatment QBP Overview

## Vision: Implement a new funding model that will drive consistent, equitable, and high-quality care for patients being treated with radiation

- The Radiation Treatment QBP model will be an activity-based bundled payment approach to:
  - Improve patient outcomes and experiences
  - Align with best practices based on clinical evidence and expert consensus
  - Improve appropriateness of care and reduce variation in care
  - Facilitate efficient use of resources, and increase both the transparency and accountability of resource utilization
  - Increase accessibility to services including new technologies to help ensure that Ontarians receive high quality and safe radiation treatment services, regardless of where they reside in the province

- The Radiation Treatment QBP supports the CCO funding strategy as:
  - Cancer treatment is typically one of, or a combination of, three modalities.  Systemic Treatment QBP has been completed, Surgery QBP is underway.  The third modality is Radiation Treatment. Completing the third treatment QBP modality will:
    - Allow CCO to better coordinate the up-stream care elements, which could lead to a diagnostic-type QBP for cancer patients in the future
    - Control areas of overlap and potential duplication of funding during treatment phases (i.e. patients requiring concurrent chemo/radiation therapy)
    - Lead to more integrated approaches to post hospital care, such as a community care QBP for cancer patients.

# Scope and Outline for RT-QBP

**Ontario Health System Funding Reform:**

Shift to patient-based funding

**Scope: Ambulatory Care  Radiation Treatment**

Activities related to direct patient care at all radiation treatment facilities

**Goal: Implement a new episode-based funding model which:**

-Ensures funding follows the patient

-Reduces inequities in funding

- Ties funding to evidence-informed practice

The following are **in scope** for now:

- All in-scope adult and pediatric volumes
- In-patient & Out-patient activities
- Benign (where appropriate)
- Costs associated with ongoing maintenance of radiation equipment and associated software/hardware
- Systemic Treatment by ROs (hormones)
- Psychosocial support

The following are **out of scope** for now:

- Physician Compensation
- Home Care
- Laboratory & diagnostic imaging
- Ontario non-OHIP activity: Any procedure that is completed for an Ontario resident who does not have a valid Ontario Health Insurance Plan (OHIP) or where funding is provided from a source other than OHIP
- Out-of-province/country activity: Any procedure that is completed for a non-Ontario resident.



*Data Source: ALR (Linkage to others as required- OHIP, NACRS, DAD, etc.)*

# Radiation Treatment Overview

## Previous Lifetime Model

**LIFETIME PER CASE FUNDING**

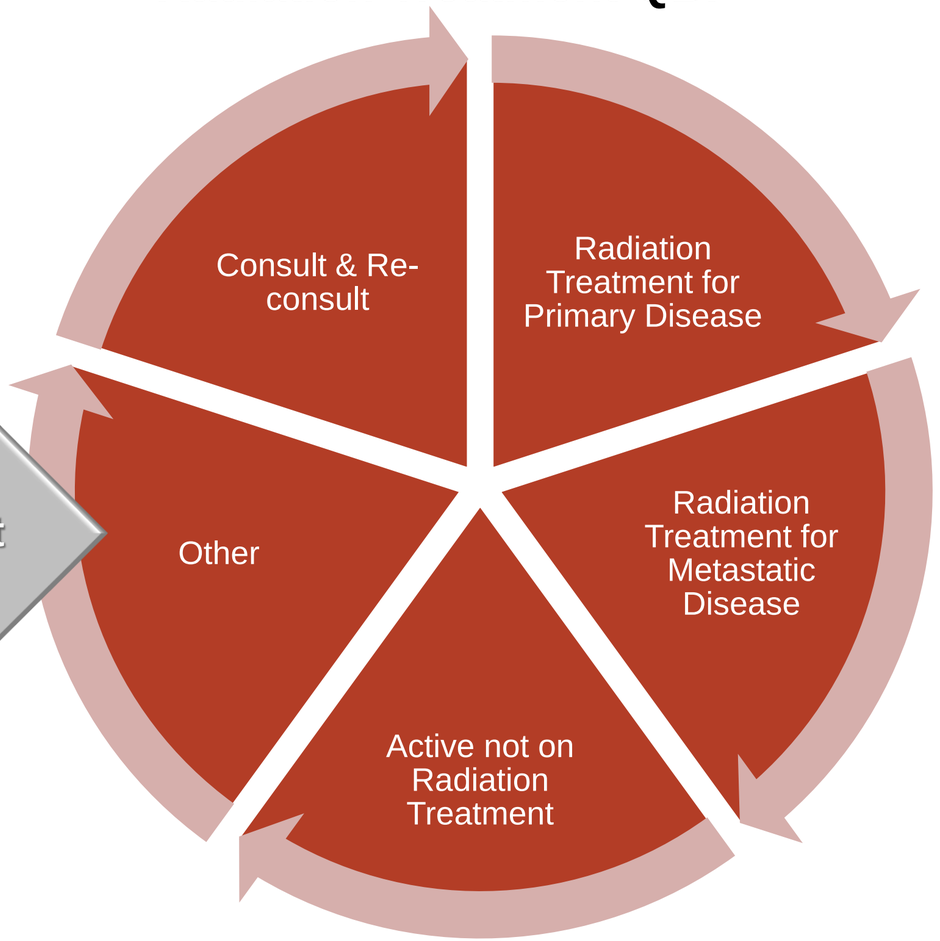
**CCO funding C1R**

**PCOP per visit Funding**

**Hospital base**

**Carve-out**

## Radiation Treatment QBP

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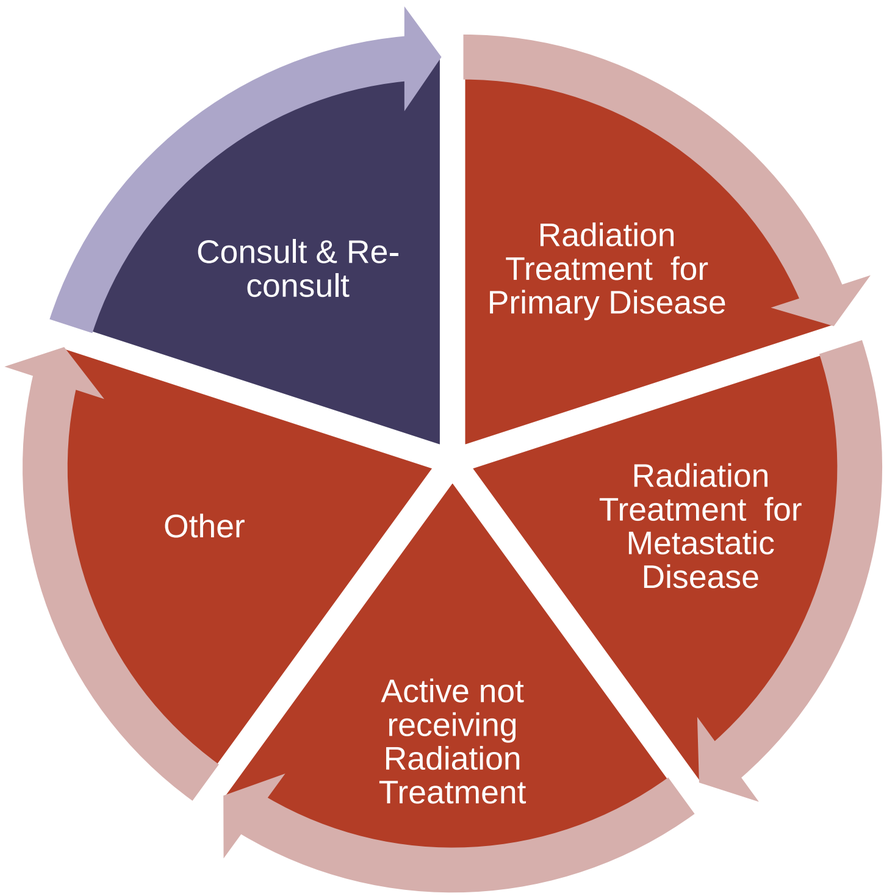
# Consultations for Radiation Treatment



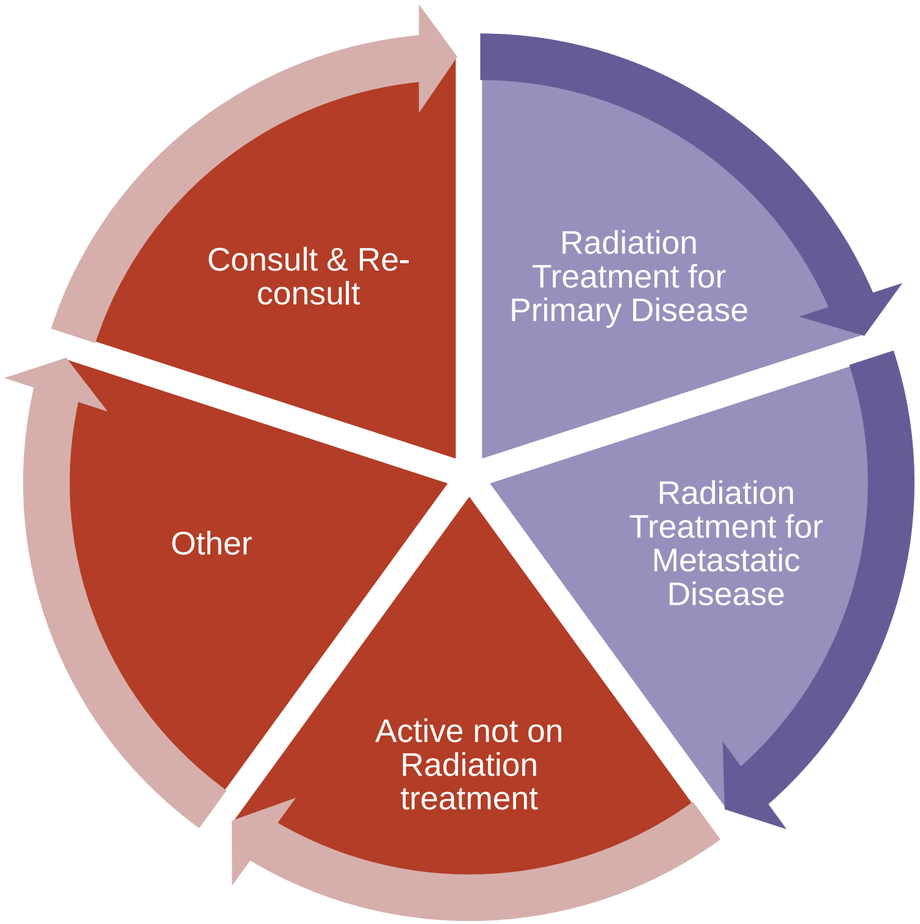

**Data**

Patient visits:
- Initial consultation
- Decision to treat

Activities:
- Patient education
  - Individual and group education session
- Psychosocial Supportive Care
- Support for patient decision-making

**Price**

# Radiation Treatments for Primary and Metastatic Diseases




**Data** **Evidence**

Treatment to Primary Disease
& Treatment for Metastatic Disease

**Includes:**

- # of Radiation Treatment Visits
- # of Ambulatory Clinic Visits
- Nursing Time
- Radiation Therapist & Planner Time
- Medical Physics Time
- HDR sources
- Supplies (immobilization, contrast, etc.)
- # of Review visits during treatments (1/week)
- Follow-up visits post-treatment

**Multiple Price Points**

# Evidence Based Framework for the Radiation Treatment QBP

Radiation treatment is well aligned with the MOHLTC's framework  a QBP- there is high variability in costs, strong feasibility and infrastructure for change, significant evidence of a need for change, and practice variation which can be reduced, where appropriate, through a new funding model.

**Cost impact:**

- Cost and expenditures vary across facilities
- Current cost impact is ~$213M
- Funding to facilities vary and does not necessarily align with patient care pathway
- Costs expected to increase

**Availability of evidence:**

- Clinical Care Guidelines developed through the program in Evidence Based Care
- CCO Disease Pathway Management Maps
- Lessons learned through Systemic QBP

**Feasibility/Infrastructure for change:**

- Clinical and administrative leaders are engaged and actively ready to participate in model development and implementation
- Existing groups can be leveraged to provide advice
- Data and reporting systems exist to allow baseline understanding of needs and opportunities
- Capital investment strategy and replacement grant will support and align with new funding model

**Practice variation:**

- Exists in:
  - Access
  - Health human resources
  - Appropriateness of care
  - Data capture and reporting
  - Use of treatment protocol regimens

# Radiation Treatment Pricing

## Activity Based Costing approach based on model published by RTP and Pharmacoeconomic unit at University of Toronto

- The Activity Based Costing (ABC) approach breaks processes down into activities that consume resources to deliver each unit of output
- Cost drivers such as time or patient load are identified for each resource within each activity

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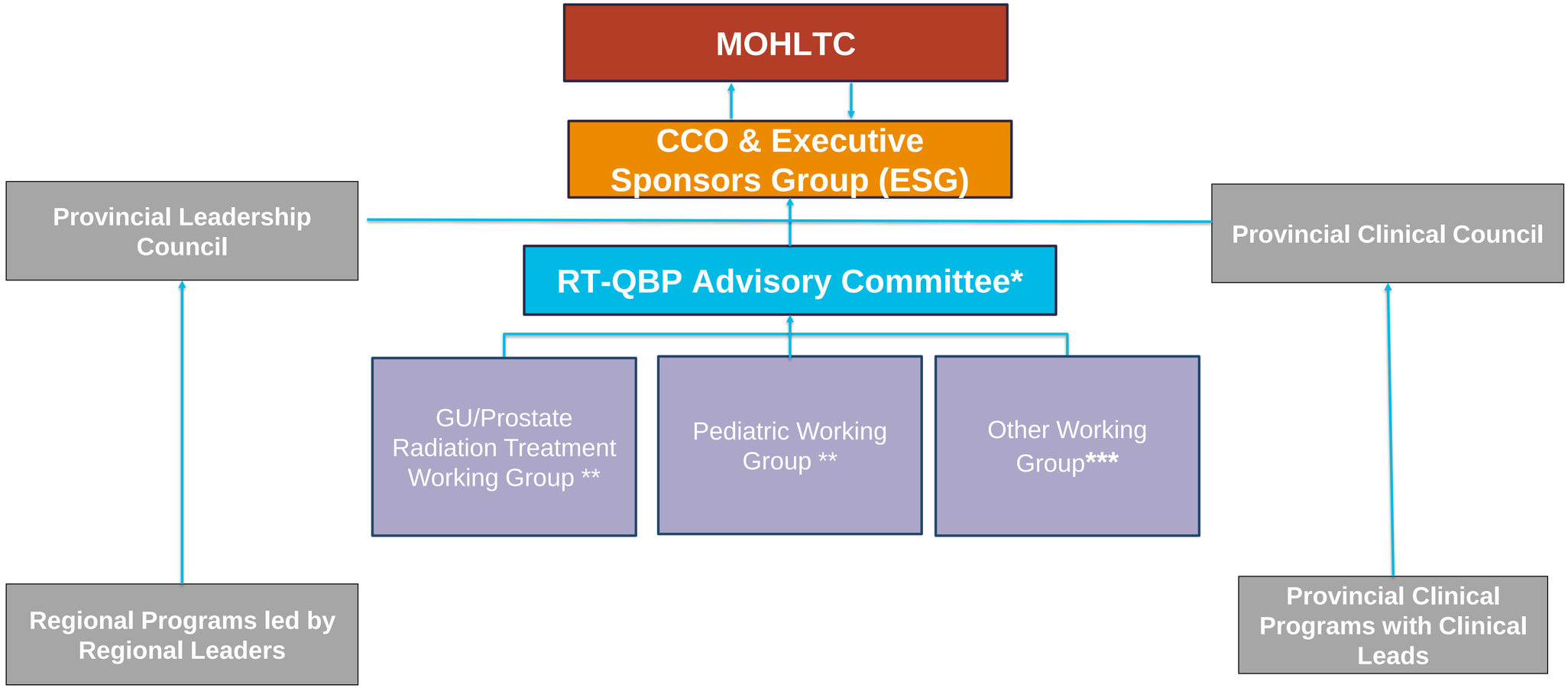
*Source: Yong et al Current Oncol 23(3) e228-238, 2016*

# RT-QBP Governance

***The RT-QBP CCO Project Team is involved all levels***

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**Membership includes administrative and clinical leadership from all regions*
***Working groups will have cross member representation and will report into the Radiation Treatment Advisory Committee which will report into the Project Team Committee.*
****Additional time limited working groups will be established as the QBP evolves*

# GU Expert Panel Group Membership

## GU Working Group Members:

| Name | Hospital |
|---|---|
| Julie Bowen | Health Sciences North |
| Patrick Chung | Sunnybrook Health Sciences Centre |
| Tim Craig | Princess Margaret Cancer Centre |
| Ian Dayes | Jurvaniski Cancer Centre |
| Louis Fenkell | Southlake Regional Health Centre |
| Adam Gladwish | Royal Victoria Regional Health Centre |
| Marlon Hagerty | Thunder Bay Regional Health Sciences Centre |
| Kardi Kennedy | Kingston Health Sciences Centre |
| Kristopher Kieraszewicz | London Health Sciences Centre |
| Josephine Kim | Sunnybrook Health Sciences Centre |
| Melisa King | Grand River Hospital |
| Vickie Kong | Princess Margaret Cancer Centre |

| Name | Hospital |
|---|---|
| Martin Korzenowski | Kingston Health Sciences Centre |
| Joda Kuk | Grand River Hospital |
| David McConnell | Thunder Bay Regional Health Sciences Centre |
| Mary Ann McGrath | Jurvaniski Cancer Centre |
| Scott Morgan **(GU Expert Panel Group Member)** | The Ottawa Hospital |
| Catherine Neath | Lakeridge Health |
| Michael Oliver | Health Sciences North |
| Sarah Rauth | Trillium Health Partners |
| Julie Renaud **Advisory Committee & GU Expert Panel Group Member** | The Ottawa Hospital |

| Name | Hospital |
|---|---|
| Jeffrey Richer **(Advisory Committee Member)** | Windsor Regional Hospital |
| George Rodrigues | London Health Sciences Centre |
| Christie Wilcox **Advisory Committee Member** | Lakeridge Health |
| Junaid Yousuf | Windsor Regional Hospital |
| Grace Zeng-Harpell | Trillium Health Partners |
| Beibei Zhang | Southlake Regional Health Centre |
| Melanie Boyd **Advisory Committee Member** | Royal Victoria Hospital |

# Evidence-based sources for RT protocols

# Evidence-based sources for RT protocols

- Existing literature
- ASTRO
- NICE
- NCCN guidelines
- Provincial and RCC-specific data
  - iPort
- Clinical expertise

| GU Expert Panel Members |
|---|
| Michael Brundage |
| Andrew Loblaw |
| Peter Chung |
| Wayne Koll |
| Margaret Hart |
| Kyle Malkoske |
| Ananth Ravi |
| Julie Renaud |
| Scott Morgan |
| Jean-Pierre Bissonnette |


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# Prostate Cancer

# Prostate Cancer Treatment Courses FY 2017/18

External Beam, intact prostate:

| Treatment Context | RT protocol long form | RT protocol short form | Dose per Fraction | Proposed Range | Estimated Provincial Frequency | Comments |
|---|---|---|---|---|---|---|
| **External Beam** | | | | | | |
| Intact Prostate | GU intact prostate single phase hypofractionated IMRT | GU_PROS_1P_HYPO_IMRT | 3 Gy | 57-62 Gy | 1034 out of 4337<br>23.8% | |
| | GU intact prostate single phase IMRT | GU_PROS_1P_IMRT | 2 Gy | 76-78 Gy | 195 out of 4337<br>4.5% | 7 cases of 70 Gy<br>7 cases of 72 Gy |
| | GU intact prostate two phase IMRT | GU_PROS_2P_IMRT | 2 Gy | 74-78 Gy | | |
| | GU intact prostate two phase 3D conformal plus IMRT | GU_PROS_2P_3D+IMRT | 2 Gy | 74-78 Gy | | Nodes must be contoured |
| | GU intact prostate single phase ultra hypofractionated | GU_PROS_1P_UHYPO | 6-8 Gy | 30-43 Gy | 117 out of 4337<br>2.7% | Includes 30/5 to 40/5<br>- Fiducial markers |
| | GU intact prostate plus pelvis simultaneous integrated boost | GU_PROS_PEL_INTBOOST | 2-3 Gy | 60-72 Gy | | NRG clinical trial |

# Prostate Cancer Treatment Courses FY 2017/18

External Beam, Post-op:

| Treatment Context | RT protocol long form | RT protocol short form | Dose per Fraction | Proposed Range | Estimated Provincial Frequency | Comments |
|---|---|---|---|---|---|---|
| **External Beam Only** | | | | | | |
| Post-op Prostate | GU prostate post-op single phase IMRT | GU_PROS_PO_1P_IMRT | 2 Gy | 66-72 Gy | 610 out of 4337 14% | |
| | GU prostate post-op two phase IMRT | GU_PROS_PO_2P_IMRT | 2 Gy | 66-72 Gy | | |
| | GU prostate post-op 3D conformal plus IMRT | GU_PROS_PO_2P_3D+ IMRT | 2 Gy | 66-72 Gy | | Nodes must be contoured |

# Prostate Cancer Treatment Courses FY 2017/18

Brachy (monotherapy):

| Treatment Context | RT protocol long form | RT protocol short form | Dose per Fraction | Proposed Range | Estimated Provincial Frequency | Comments |
|---|---|---|---|---|---|---|
| **Brachy** | | | | | | |
| Brachy | GU prostate HDR, 1 fraction | GU_PROS_1P_HDR(1)(CT) | | 18-19 Gy | 27 | Intra-operative planning<br><br>Clinical trial (CT) |
| | GU prostate HDR, 2 fractions | GU_PROS_1P_HDR(2) | | 20-27 Gy | 18 | Intra-operative planning |
| | GU prostate LDR | GU_PROS_1P_LDR | | 144-145 Gy | 206 | Intra-operative planning |

# Prostate Cancer Treatment Courses FY 2017/18

External Beam + Brachy:

| Treatment Context | RT protocol long form | RT protocol short form | Dose per Fraction (External) | Proposed Range | Estimated Provincial Frequency | Comments |
|---|---|---|---|---|---|---|
| **External Beam + Brachy** | | | | | | |
| | GU Prostate HDR + IMRT | GU_PROS_2P_HDR+IMRT | 2.5 Gy | 13-15 Gy (HDR) + 37-39 Gy (IMRT) | 125 | 108 (external beam doses do not fit in range) |
| | GU Prostate LDR + IMRT | GU_PROS_2P_LDR+IMRT | 2.5 Gy | 105 Gy (LDR) + 37-39 Gy (IMRT) | 10 | |
| | GU Prostate LDR + IMRT/3D Pelvis | GU_PROS_2P_LDR+PEL | 1.8-2 Gy | 105 Gy (LDR) + 45-50 Gy | 2 | Nodes must be contoured |
| | GU Prostate HDR + IMRT/3D Pelvis | GU_PROS_2P_HDR+PEL | 1.8-2 Gy | 13-15 Gy (HDR) + 45-50 Gy | 32 | Nodes must be contoured |

# Quality Metrics Development

# Quality Metrics Development

01 Infrastructure

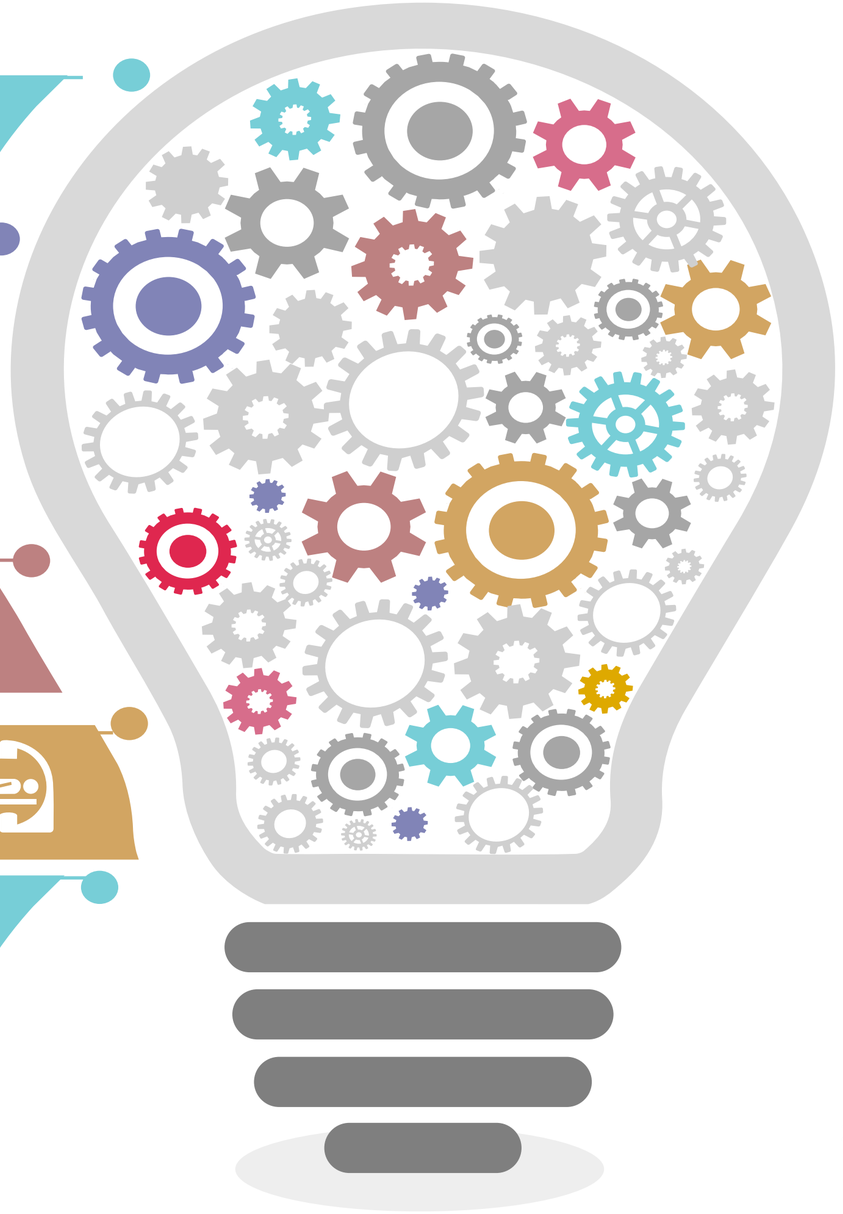
02 Pre-Treatment Phase

03 Imaging and Planning Phase.

04 Quality Assurance Phase

05 Treatment Phase

06 Post-Treatment Phase.



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# Quality Metrics

## Quality Indicators that will apply across all RT Protocols

- Peer Review QA
- Physics and Therapy QA
- Etc…

## Quality Indicators that may be RT Protocol Specific

- VMAT – may require patient specific measurements
- Brachytherapy may have specific quality metrics
- On Treatment imaging – may be disease specific – Daily for some but maybe not others

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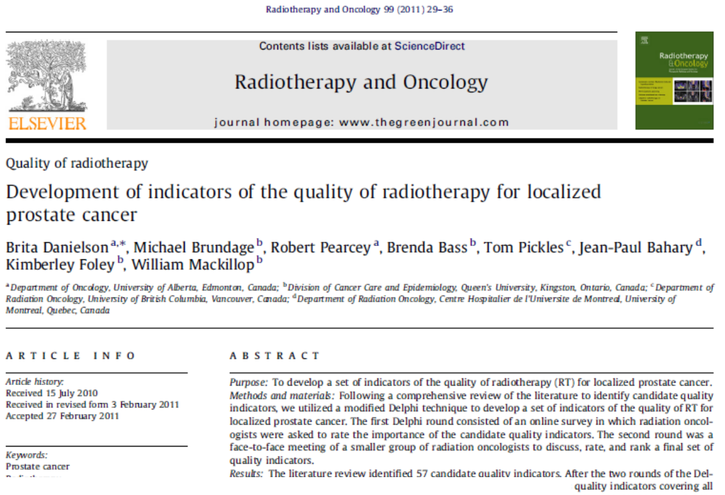

Radiotherapy and Oncology 99 (2011) 29–36

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Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

Quality of radiotherapy

Development of indicators of the quality of radiotherapy for localized prostate cancer

Brita Danielson [a,*], Michael Brundage [b], Robert Pearcey [a], Brenda Bass [b], Tom Pickles [c], Jean-Paul Bahary [d], Kimberley Foley [b], William Mackillop [b]

[a] Department of Oncology, University of Alberta, Edmonton, Canada; [b] Division of Cancer Care and Epidemiology, Queen's University, Kingston, Ontario, Canada; [c] Department of Radiation Oncology, University of British Columbia, Vancouver, Canada; [d] Department of Radiation Oncology, Centre Hospitalier de l'Universite de Montreal, University of Montreal, Quebec, Canada

ARTICLE INFO

*Article history:*
Received 15 July 2010
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*Keywords:*
Prostate cancer

ABSTRACT

*Purpose:* To develop a set of indicators of the quality of radiotherapy (RT) for localized prostate cancer.
*Methods and materials:* Following a comprehensive review of the literature to identify candidate quality indicators, we utilized a modified Delphi technique to develop a set of indicators of the quality of RT for localized prostate cancer. The first Delphi round consisted of an online survey in which radiation oncologists were asked to rate the importance of the candidate quality indicators. The second round was a face-to-face meeting of a smaller group of radiation oncologists to discuss, rate, and rank a final set of quality indicators.
*Results:* The literature review identified 57 candidate quality indicators. After the two rounds of the Del-

Contents lists available at SciVerse ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

Quality assurance in prostate RT

A criterion-based audit of the technical quality of external beam radiotherapy for prostate cancer

Michael Brundage [a,b,*], Brita Danielson [c], Robert Pearcey [c], Brenda Bass [a], Tom Pickles [d], Jean-Paul Bahary [e], Yingwei Peng [a], David Wallace [a], William Mackillop [a,b]

[a] Division of Cancer Care and Epidemiology, Queen's Cancer Research Institute, Kingston, Ontario, Canada; [b] Departments of Oncology, and Community Health and Epidemiology, Queen's University, Kingston, Ontario, Canada; [c] Department of Oncology, Division of Radiation Oncology, University of Alberta, Edmonton, Alberta, Canada; [d] Department of Radiation Oncology, British Columbia Cancer Agency, University of British Columbia, Vancouver, British Columbia, Canada; [e] Department of Radiation Oncology, Centre Hospitalier de l'Universite de Montreal, University of Montreal, Montreal, Quebec, Canada

ARTICLE INFO

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Received 16 November 2012
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*Keywords:*
Prostate cancer
Radiotherapy

ABSTRACT

*Purpose:* To evaluate the technical quality of external beam radiotherapy for prostate cancer in Canada.
*Methods:* This was a multi-institution, retrospective study of a random sample of patients undergoing radiotherapy (RT) for prostate cancer in Canada. Patterns of care were determined by abstracting details of the patients' management from original records. The quality of patient's technical care was measured against a previously published, comprehensive suite of quality indicators.
*Results:* 32 of the 37 RT centres participated. The total study population of 810 patients included 25% low-risk, 44% intermediate-risk, and 28% high-risk cases. 649 received external beam RT (EBRT) only, for whom compliance with 12 indicators of the quality of pre-treatment assessment ranged from 56% (sexual function documented) to 96% (staging bone scan obtained in high-risk patients). Compliance with

# Quality Metrics – Prostate External Beam

# Institutional Expectations (EBRT)

Institutional Policies should be developed outlining:

1. Pre-treatment assessment and documentation
2. CT simulation protocols (MRI Simulation, where indicated) and planning protocols including dose to targets and constraints
3. Quality assurance steps
4. Treatment protocols to include frequency of imaging and image guidance strategies
5. Post-treatment follow-up

# Quality Metrics Prostate Cancer - EBRT

## Pre-treatment

Documentation:

- Documentation of current disease (T category, pre-treatment PSA, Gleason score), medical co-morbidities
  - Mp MRI (< 6 months of treatment decision, before ADT) – recommended only if considering SABR
- Documentation of baseline bowel, urinary and sexual functional status
- Documentation of medical history and physical exam
- Metastatic Work-up as per Institutional protocols
- Documentation of consideration of ADT for high-intermediate and high-risk cases
- Obtaining informed consent

# Quality Metrics Prostate Cancer - EBRT

## Imaging and planning

Contour:

- Contouring of prostate (and SVs as indicated)  and all relevant normal tissues should be performed to include bladder, rectum, femoral heads, relevant bowel at a minimum
- If pelvic lymph nodes are to be treated, they must be contoured

Fiducial Markers insertion:

- Optional unless SABR planned (consider trans-perineal approach)

# Quality Metrics Prostate Cancer - EBRT

## Imaging and planning

Dose Constraints:

- Institutionally defined dose constraints should be documented and DVHs obtained specific to each dose/fractionation protocol used (see next slide)

Technique:

- IMRT or VMAT should be used in standard or conventional hypo-fractionation cases to minimize dose to normal tissues

# Quality Metrics Prostate Cancer - EBRT

- Imaging and Planning Phase Suggested Dose/volume Constraints:

**Hypofractionation - PROFIT Study**

| Volume of interest | Metric | Dose criteria (Gy) |
|---|---|---|
| CTV60 | D99 | ≥ 6000 |
| PTV60 | D99 | ≥ 5700 |
| | Max dose to 1cc | ≤ 6300 |
| Rectum wall | D50 | ≤ 3700 |
| | D70 | ≤ 4600 |
| Bladder wall | D50 | ≤ 3700 |
| | D70 | ≤ 4600 |
| LFEMUR/RFEMUR | D5 | ≤ 4300 |

**Conventional fractionation - PROFIT Study**

| Volume of interest | Metric | Dose criteria (Gy) |
|---|---|---|
| CTV | D99 | ≥ 7800 |
| PTV | D99 | ≥ 74100 (-5%) |
| | Max dose to 1cc (+5%) | ≤ 8190 |
| Rectum wall | D50 | ≤ 5300 |
| | D70 | ≤ 7100 |
| Bladder wall | D50 | ≤ 5300 |
| | D70 | ≤ 7100 |
| LFEMUR/RFEMUR | D5 | ≤ 5300 |

# Quality Metrics Prostate Cancer - EBRT

- Imaging and Planning Phase Suggested Dose/volume Constraints:

**SABR - Odette**

| Volume of interest | Criteria |
|---|---|
| CTV-PTV | 3-5 mm margins |
| Prostate | 40 Gy/5 fx EOD or weekly |
| PTV | 36.5 Gy/5 Fx, CI<1.2 |
| Rectum | V36<1.0cc<br>Minor dev V36 < 1.5cc |
| Bladder | 37 Gy <10cc<br>Minor dev V37 <20cc |
| Bowel | V30 Gy< 1.0cc |

# Quality Metrics Prostate Cancer - EBRT

## Quality Assurance

### Peer Review:

- As per CCO Radiation Oncology Peer Review Guidance Document

https://www.cancercareontario.ca/sites/ccocancercare/files/assets/CCORadiationOncologyPeerReview.pdf?redirect=true

### QA of treatment plans:

- QA of all treatment plans shall be performed by a medical physicist and radiation therapist, as per institutional guidelines

### Patient-specific QA (e.g. individual patient dosimetry for VMAT/IMRT):

- As per CPQR guidelines: http://www.cpqr.ca/wp-content/uploads/2017/01/PDM-2016-07-01.pdf
- Especially important for ultra-fractionated approaches

# Quality Metrics Prostate Cancer - EBRT

## Treatment

### Image guidance:

- Daily Image guidance (using CBCT soft-tissue matching or fiducial markers) must be used

### Six DOF Couch:

- Use of Six DOF Couch suggested if SABR used

# Quality Metrics Prostate Cancer - EBRT

## Follow-up

- As per CCO guidelines (DPM Prostate Cancer follow-up map)
  https://archive.cancercare.on.ca/common/pages/UserFile.aspx?fileId=349944

**RECOMMENDATION 2**

No evidence-based recommendation can be made with respect to follow-up schedule of PSA testing for prostate cancer survivors following curative-intent treatment with non-surgery primary therapy, including any form of radiation therapy, cryotherapy, or high-intensity focused ultrasound.

However, the Prostate Cancer Follow-up Expert Panel suggests the following as a reasonable schedule. This schedule for PSA testing is in line with PSA kinetics following therapy, other guidelines, and their clinical experience:

- First test six months after treatment completion
- Every six months until end of year 5
- Annually thereafter

***Qualifying Statements for Recommendation 2***

- Even though PSA follow-up is recommended annually until end of life, healthcare professionals should use their own discretion in determining the applicability of annual surveillance in patients who are unlikely to benefit from salvage therapy.

# Quality Metrics – Prostate Brachy

# Institutional Guidelines (brachy)

Institutional Policies (brachy) should be developed outlining:

1. Pre-treatment assessment and documentation
2. US volume studies (MR imaging, where indicated) and planning protocols including dose to targets and constraints
3. Quality assurance strategies
4. Treatment protocols to include frequency of imaging and image guidance strategies
5. Post-treatment follow-up

# Quality Metrics Prostate Cancer - Brachy

## Pre-treatment

### Enabling intra-operative brachytherapy planning:

- Appropriate HR support (i.e. nursing, anesthesia, radiation therapy, medical physics) to allow for intra-operative brachytherapy planning

### Documentation:

- Documentation of current disease (T-category, pre-treatment PSA, Gleason score), medical co-morbidities, as well as bowel, urinary and sexual functional status
- No TURP

### CCO/ASCO guidelines:

- https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/37776

# Quality Metrics Prostate Cancer - Brachy

## Imaging and planning:

**LDR**: Volume studies

- Documenting volume study (TRUS/MR) with urethra visualization strategy
- MRI strongly encouraged

**LDR:** Time under anesthesia:

- Should only be greater than 4 hours in exceptional cases

**LDR**: Dosimetric aims/targets

- Prostate D90 > 100%
- Prostate V100> 90%
- Rectum D1cc < 100%

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# Quality Metrics Prostate Cancer - Brachy

## Imaging and planning:

**HDR:** Time under anesthesia:

- Should only be greater than 4 hours in exceptional cases

**HDR**: Dosimetric aims/targets

- Prostate D90 > 100%
- Prostate V100> 95%
- Rectum D1cc < 100%
- Urethra D10 < 118%

# Quality Metrics Prostate Cancer - Brachy

## Quality Assurance

**LDR:** Seed QA:

- Seed order and seed QA essential

**LDR:** Annual QA:

- As per CPQR, AAPM TG 56/40 (dosimetry independent audit)

**HDR:** Intra-operative patient-specific QA

- Pre-treatment QA as per CPQR, AAPM TG 56/40

**HDR:** Afterloader QA:

- Quarterly and annual HDR afterloader QA as per CPQR, AAPM TG 56/40

# Quality Metrics Prostate Cancer - Brachy

## Follow-up

**LDR:** post-implant:

- One-month volumetric post-implant peer review QA involving CT or MR

**HDR:** post-treatment:

- Post-treatment peer-review QA

# Quality Metrics Prostate Cancer - Brachy

## Follow-up

**As per CCO guidelines:**

- https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/266

**RECOMMENDATION 2**

No evidence-based recommendation can be made with respect to follow-up schedule of PSA testing for prostate cancer survivors following curative-intent treatment with non-surgery primary therapy, including any form of radiation therapy, cryotherapy, or high-intensity focused ultrasound.

However, the Prostate Cancer Follow-up Expert Panel suggests the following as a reasonable schedule. This schedule for PSA testing is in line with PSA kinetics following therapy, other guidelines, and their clinical experience:

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***Qualifying Statements for Recommendation 2***

- Even though PSA follow-up is recommended annually until end of life, healthcare professionals should use their own discretion in determining the applicability of annual surveillance in patients who are unlikely to benefit from salvage therapy.

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# Bladder Cancer

# Bladder RT Protocols

| Treatment Context | RT protocol long form | RT protocol short form | Dose per Fraction | Proposed Range | Comments |
|---|---|---|---|---|---|
| **Bladder IMRT** | | | | | |
| Bladder | Bladder only, moderate HYPO | GU_BLAD_1P_HYPO_IMRT | 2.5-3 Gy | 50-55 Gy | |
| | Bladder only, conventional fractionation | GU_BLAD_1P_IMRT | 1.8-2 Gy | 60-66 Gy | |
| | Bladder – with pelvic nodes two phase | GU_BLAD_2P_PELNO_IMRT | 1.8-2 Gy | 60-66 Gy (to the bladder) | Nodes must be contoured |
| | Bladder – with pelvic nodes two phase 3D | GU_BLAD_2P_PELNO_3D | 1.8-2 Gy | 60-66 Gy (to the bladder) | Nodes must be contoured |
| | Bladder pre and post-op | GU_BLAD_PRE-PO_1P_IMRT | 2-5 Gy | 25-60 Gy | |

# Quality Metrics – Bladder

# Institutional Expectations (Bladder)

Institutional policies should be developed outlining:

1. Pre-treatment assessment and documentation
2. CT simulation protocols (MRI Simulation, where indicated) and planning protocols including dose to targets and constraints
3. Quality assurance
4. Treatment protocols to include frequency of imaging and image guidance strategies
5. Post-treatment follow-up

# Quality Metrics - Bladder

## Pre-treatment

TURBT:

- Complete TURBT if possible

MRI:

- Pelvic MRI to assess tumour extent is recommended, if tumour boost is prescribed

Documentation:

- Stage, grade, presence of concomitant CIS, tumour size, urine cytology, blood work
- Documentation of baseline bowel, urinary and sexual functional status
- Documentation of medical history and physical exam
- Metastatic work-up as per institutional protocols
- Obtaining informed consent

# Quality Metrics - Bladder

## Imaging and planning

Target delineation and coverage:

- The bladder should be contoured along with the tumour volume, as appropriate. If pelvic lymph nodes are to be treated, they should also be contoured. If boost is being used, fiducial markers should be used, where possible.

Normal Tissue:

- Treatment techniques should be used to minimize dose to the organs at risk. These should be contoured and DVH's should be obtained.

# Quality Metrics - Bladder

## Treatment

### Daily volumetric imaging:

- The bladder/target volume must be monitored daily by soft tissue or 3D imaging techniques

### Adaptive Approach:

- An adaptive approach using cone beam/soft tissue imaging, should be considered
- References:
  - Foroudi, F., Pham, D., Bressel, M., Hardcastle, N., Gill, S., & Kron, T. (2014). Comparison of margins, integral dose and interfraction target coverage with image-guided radiotherapy compared with non-image-guided radiotherapy for bladder cancer. *Clinical Oncology*, *26*(8), 497-505.
  - Kong, V., Taylor, A., Chung, P., & Rosewall, T. (2018). Evaluation of resource burden for bladder adaptive strategies: A timing study. Journal of medical imaging and radiation oncology.

### Peer review:

- As per institutional guidelines and CCO Radiation Oncology Peer Review Guidance Document

https://www.cancercareontario.ca/sites/ccocancercare/files/assets/CCORadiationOncologyPeerReview.pdf?redirect=true

# Quality Metrics - Bladder

## Follow-up

### Recommended follow-up interval as per

Zuiverloon, T. C., van Kessel, K. E., Bivalacqua, T. J., Boormans, J. L., Ecke, T. H., Grivas, P. D., ... & Roghmann, F. (2018, February). Recommendations for follow-up of muscle-invasive bladder cancer patients: A consensus by the international bladder cancer network. In *Urologic Oncology: Seminars and Original Investigations*. Elsevier.

| Months | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory test[a] | Laboratory testing should be done as clinically indicated | | | | | | | | | | | | | |
| Imaging[b] | | X | | X | | X | | X | | X | | X | | X |
| Cytoscopy | X | X | X | X | | X | | X | X | X | X | X | | X |
| Cytology[c] | | X | | X | | X | | X | | X | | X | | X |

[a]Laboratory testing should be done as clinically indicated.

[b]Imaging is defined as chest X-ray + CT abdomen, or preferable CT of the thorax and abdomen.

[c]Cytology is only recommended in centres with sufficient experience and trained staff, also taking into consideration that radiotherapy increases the number of atypical cells in a cytology specimen.

# Testicular Cancer

# Testis RT Protocols

| Treatment Context | RT protocol long form | RT protocol short form | Dose per Fraction | Proposed Range | Comments |
|---|---|---|---|---|---|
| **Testis** | | | | | |
| Testis | Testis stage 1 | GU_TESTIS_STAGE1 | 1.25 Gy | 25 Gy | |
| | Testis stage 2 | GU_TESTIS_STAGE2 | 1.25Gy – 1.75 Gy | 25 Gy + 10 Gy | Recommendation: done as field in field integrated boost<br><br>Dose fractionation is 35 Gy in 20-25 Gy |

# Quality Metrics – Testicular Cancer

# Institutional Expectations (testis)

Institutional policies should be developed outlining:

1. Pre-treatment assessment and documentation
2. CT simulation protocols and planning protocols including dose to targets and constraints
3. Quality assurance
4. Treatment protocols to include frequency of imaging and image guidance strategies
5. Post-treatment follow-up

# Quality Metrics – Testis

## Pre-treatment

Sperm-banking:

- Discussion of sperm-banking should take place

Documentation:

- Documentation of stage and serum tumour markers
- Documentation of baseline bowel, urinary and sexual functional status
- Metastatic work-up as per institutional protocols
- Documentation of medical history and physical exam
- Obtaining patient consent

# Quality Metrics – Testis

## Imaging and planning

Normal Tissue Doses:

- Kidneys, heart, and bladder should be contoured, where appropriate (simulate and treat with bladder empty). If testicular shield is to be used, this should be taken into account at the time of simulation. Treatment techniques should minimize doses to organs at risk and DVH's should be obtained.

Target delineation and coverage:

- Nodal regions to be treated, should be contoured. In IIA/IIB, GTV should be outlined.

# Quality Metrics – Testis

## Treatment

Daily imaging

Testicular shield should be used if fertility is a concern

Peer review:

- As per Institutional guidelines and CCO Radiation Oncology Peer Review Guidance Document

https://www.cancercareontario.ca/sites/ccocancercare/files/assets/CCORadiationOncologyPeerReview.pdf?redirect=true

Management of Stage 1 patients:

- As per CCO PEBC guidelines

https://archive.cancercare.on.ca/common/pages/UserFile.aspx?fileId=14046

# Penile Cancer

# Penile RT Protocols

| Treatment Context | RT protocol long form | RT protocol short form | Dose per Fraction | Proposed Range | Estimated Provincial Frequency | Comments |
|---|---|---|---|---|---|---|
| **Penile Cancer** | | | | | | |
| Penis | Inguinal/pelvic nodes IMRT | GU_PENIS_IMRT | 1.8-2 Gy | 46-60 Gy | 10 | |
| | Penile Brachy mold | GU_PENIS_BRACHY | 3.6 Gy | 36 Gy | 1 | |

# GU-Unspecified
# Ureter, renal pelvis, kidney, other unspecified

# Provincial dose/fraction usage

## Other unspecified urinary organs

| RAD Tech | Total Dose | fractions | Numerator | Denominator | Sum of Percent |
|---|---|---|---|---|---|
| BRACHY | 20 | 4 | 1 | 1 | 100.00% |
| IMRT | 10 | 5 | 1 | 8 | 12.50% |
| | 20 | 10 | 2 | 8 | 25.00% |
| | 45 | 25 | 1 | 8 | 12.50% |
| | 46 | 23 | 1 | 8 | 12.50% |
| | 46.23 | 23 | 1 | 8 | 12.50% |
| | 50 | 25 | 1 | 8 | 12.50% |
| | 64 | 32 | 1 | 8 | 12.50% |

## In situ other and unspecified

| RAD Tech | Total Dose | fractions | Numerator | Denominator | Sum of Percent |
|---|---|---|---|---|---|
| BRACHY | 40 | 10 | 1 | 1 | 100.00% |
| IMRT | 6 | 2 | 1 | 8 | 12.50% |
| | 38 | 20 | 1 | 8 | 12.50% |
| | 50.2 | 20 | 1 | 8 | 12.50% |
| | 54 | 18 | 1 | 8 | 12.50% |
| | 57 | 19 | 1 | 8 | 12.50% |
| | 66 | 33 | 2 | 8 | 25.00% |
| | 76 | 38 | 1 | 8 | 12.50% |
| NO SPECIAL TECHNIQL | 75 | 2 | 1 | 1 | 100.00% |

## Renal Pelvis

| RAD Tech | Total Dose | fractions | Numerator | Denominator | Sum of Percent |
|---|---|---|---|---|---|
| IMRT | 38.4 | 15 | 1 | 1 | 100.00% |
| STEREOTACT | 21 | 1 | 2 | 3 | 66.67% |
| | 35 | 5 | 1 | 3 | 33.33% |

## Other unspecified male genital

| RAD Tech | Total Dose | fractions | Numerator | Denominator | Sum of Percent |
|---|---|---|---|---|---|
| IMRT | 50 | 25 | 1 | 1 | 100.00% |

## Ureter Cancer

| RAD Tech | Total Dose | fractions | Numerator | Denominator | Sum of Percent |
|---|---|---|---|---|---|
| IMRT | 45 | 25 | 1 | 2 | 50.00% |
| | 54 | 27 | 1 | 2 | 50.00% |
| NO SPECIAL TECHNIQL | 45 | 25 | 2 | 2 | 100.00% |

## Kidney Cancer

**Province**

IMRT

| Dose | Fraction | Numerator | Denominator | % use |
|---|---|---|---|---|
| 25 | 25 | 2 | 23 | 8.70% |
| 35 | 5 | 2 | 23 | 8.70% |
| 60 | 15 | 2 | 23 | 8.70% |

No special technique

| Dose | Fraction | Numerator | Denominator | % use |
|---|---|---|---|---|
| 10.5 | 7 | 4 | 12 | 33.33% |
| 14 | 14 | 2 | 12 | 16.67% |
| 20 | 5 | 2 | 12 | 16.67% |

Stereotactic

| Dose | Fraction | Numerator | Denominator | % use |
|---|---|---|---|---|
| 35 | 5 | 12 | 93 | 12.90% |
| 40 | 5 | 18 | 93 | 19.35% |
| 60 | 15 | 2 | 23 | 8.70% |

# Draft GU-Unspecified RT Protocols

| Treatment Context | RT protocol | Proposed Range | Number of fractions | Dose per Fraction | Estimated Provincial Frequency | Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| GU-Unspecified | GU_unspecified | 50 Gy | 25 | 2 Gy | | Can only be selected for:<br>- Renal pelvis<br>- Kidney cancer<br>- Ureter cancer<br>- Other unspecified urinary organs<br>- In situ other and unspecified<br>- Other unspecified male genitals<br><br>Selected by ICD03 coding |

# Active surveillance

# GU – Active surveillance

Patients with prostate and testicular cancer have options for active surveillance

**Prostate cancer –**

- Will use established CCO guideline recommendations:

https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/2286

**Testicular cancer –**

- Will use established CCO guideline recommendations:

https://archive.cancercare.on.ca/common/pages/UserFile.aspx?fileId=14046

# Micro Costing Activities

# Funding Activities

**Disease Site Specific Protocol Confirmation**

- Disease Site Expert Panel Group and Disease Site Working Group will develop and confirm all disease site protocols for the RT-QBP

**HR Resource Data Collection**

- The Funding Unit will work with the following groups to complete preliminary work on HR related costing inputs for disease-site specific radiation treatment protocols:
  - Physics Professional Advisory Committee (PPAC)
  - Radiation Therapy Professional Advisory Committee (RThPAC)
  - RCC Director
- The preliminary work will be reviewed with the Disease Site specific Working Group and Advisory Committee for feedback and approval

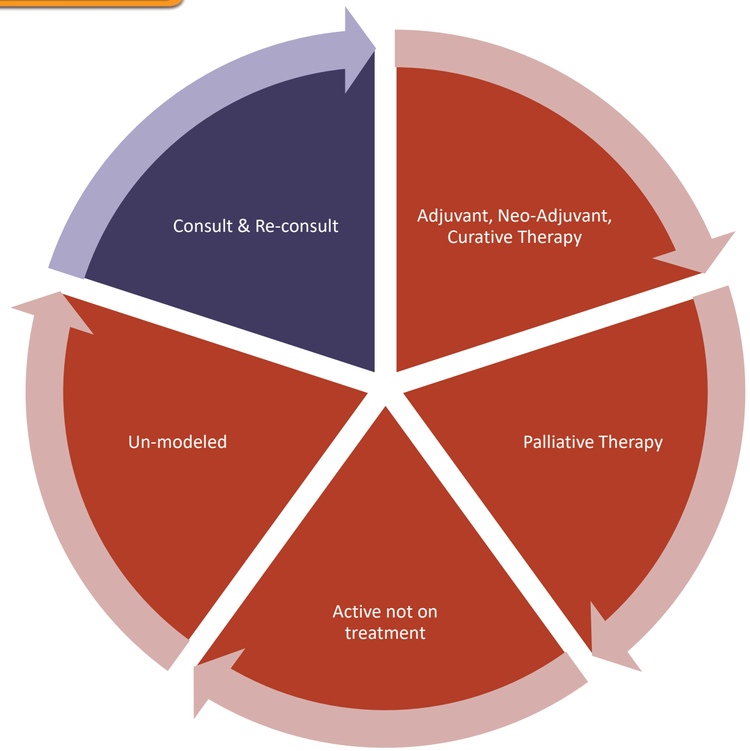
**Infrastructure and Equipment Use**

- The Funding Unit will work with members of the Infrastructure and Equipment Working Group to complete preliminary work on costing inputs and data collection for infrastructure and equipment use for radiation treatment (e.g. minor equipment, major equipment, patient specific supplies)
- The preliminary work will be reviewed with Disease Site specific Working Group and Advisory Committee for feedback and approval

# Psychosocial Oncology (PSO)

# Systemic Therapy QBP and PSO

**PSO funds are built into Consult bundle but they are meant to cover the whole patient journey!!**




**Survey** **Data** **Providers**

**Patient visits:**
- **Initial consultation**
- **Decision to treat**

**Activities:**
- **Patient education**
  - **Pre-medication counseling**
  - **Individual and group education session**
- **Psychosocial Supportive Care**
- **Co-ordination of drug access**
- **Medication Reconciliation**
- **Support for patient decision-making**

232 minutes of PSO time for 6 PSO specialties

**Price**

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# Quantifying Patient Needs for PSO for the Systemic QBP: Example for Occupational Therapy

## OCCUPATIONAL THERAPY

**Project Advisors:**

| Name | Organization |
|---|---|
| Leslie Gibson | Odette Cancer Centre |
| Stephanie Phan | Princess Margaret Cancer Centre |
| Mary Egan | The Ottawa Hospital Regional Cancer Centre |

**Visit Type Time Allocations:**

First consult visit = 105 minutes (60 minutes for direct, 45 minutes non-patient facing time work)

Follow-up visit = 90 minutes (45 minutes for direct, 45 minutes for non-patient facing time)

| **"HIGH NEEDS" PATIENTS** (Lung, GI, Gynecological, CNS, Breast, Skin (Melanoma)) | | | |
|---|---|---|---|
| | **BUNDLE 1 (CONSULT PHASE)** | **BUNDLE 2 (TREATMENT WITH CURATIVE INTENT)** | **BUNDLE 3 (FOLLOW UP/SURVIVORSHIP PHASE)** |
| **First Consult with OT** | 10% of all high needs patients need a first consult | 25% of all high needs patients need a first consult | 25% of all high needs patients need a first consult |
| **SUMMARY** | **60% of all high needs patients need to be seen by an OT for a first consult visit at some point in their systemic cancer journey** | | |
| **Follow Ups with OT** | 5% of all high needs patients need a follow up visit<br><br>2.25 f/u visits needed | 32.5% of all high needs patients need a follow up visit<br><br>7.25 f/u visits needed | 35% of all high needs patients need follow up visits<br><br>6 f/u visits needed |

- Convened expert panels for each PSO discipline
- Experts were asked to identify patient needs in a "blue sky" ideal state, assuming no resource constraints
- ESAS symptom burden data informed decisions where relevant
- These PSO workload estimates were given to the Funding Team for incorporation into the Systemic QBP

# Identifying high needs populations for PSO: Proposed Approach for Radiation QBP

**High Need:**

- Head and Neck
- Upper GI
- Lower GI
- Lung
- Lymphoma
- Breast

- These disease sites will be discussed individually (and may be broken down further into sub-disease sites), unless expert panel thinks it is appropriate to group some sites together based on intensity of need

**"Average Need":**

- CNS
- Genitourinary
- GYN
- Hematology (non-lymphoma)
- Sarcoma
- Skin

- Disease sites will be grouped together unless experts feel any particular group needs to be treated individually

**"Very Low/No Need"**

- Propose to ask if there are groups who rarely or never require dietitian services; these populations will not be discussed/included in model for those services

*For some disciplines (i.e. mental health)- PSO need may not vary by disease site but by psychosocial factors

# DRAFT Framework to Quantify Patient PSO Needs for RT QBP

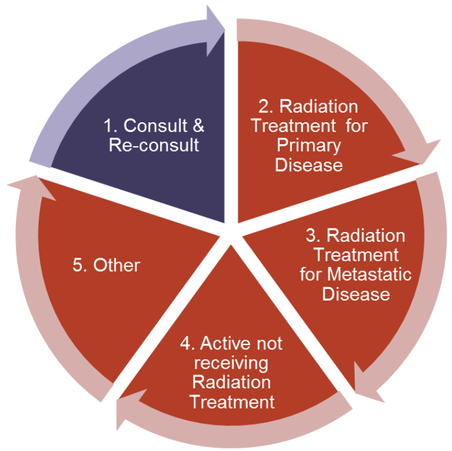
To be completed for:

- Each PSO discipline, each “needs group” for that discipline
- Example below is for dietitians/head and neck patients):

| Treatment Population | Phase/Bundle of Radiation Therapy Pathway | | | | |
|---|---|---|---|---|---|
| | Consult with RO | Radiation Treatment- Primary (curative intent) | Post- Radiation Well Follow Up (survivorship care) | Radiation Treatment- Metastatic (palliative intent) | Post- Radiation Follow Up (EOL/palliative care) |
| Radiation Treatment Only | Total # of dietitian minutes required (average) | Total # of dietitian minutes required (average) | Total # of dietitian minutes required (average) | Total # of dietitian minutes required (average) | Total # of dietitian minutes required (average) |
| Systemic Treatment Only | Revisit and Update Systemic QBP Assumptions | | | | |
| RT/ST Combined modality | Review what is already included for Systemic QBP and ask: is there additional time needed for combined RT/ST patients? | Review what is already included for Systemic QBP and ask: is there additional time needed for combined RT/ST patients? | Review what is already included for Systemic QBP and ask: is there additional time needed for combined RT/ST patients? | Review what is already included for Systemic QBP and ask: is there additional time needed for combined RT/ST patients? | Review what is already included for Systemic QBP and ask: is there additional time needed for combined RT/ST patients? |

# Example- Quantifying PSO Needs for RT Only patients – Consult Bundle

Example:
- PSO Discipline: Dietitians
- Disease Site/Population: Head and Neck




- What % of head and neck patients need a 1st consult* with a dietitian during this phase?
- What % of head and neck patients need a follow-up visit** with a dietitian during this phase?
- How many follow up visits are needed during this phase, on average? (*will need data on average length of time for this bundle*)
- What is the clinical rationale for this?

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*total number of minutes for a dietitian 1st consult to be determined prior to exercise- will propose to use same time amounts as for Systemic
**total number of minutes for a follow up visit with a dietitian to be determined prior to exercise

# Data and Information to Support Expert Consensus Process

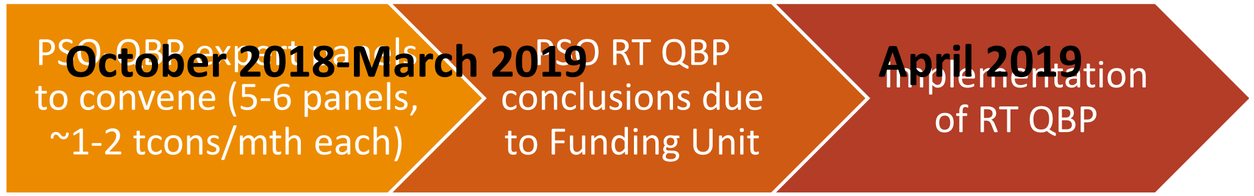
- **Data on treatment populations (RT only/ST only/RT-ST combined)**
  - Needed by major disease site; drill down to sub-disease site level if needed
  - Rationale: efficiency under tight timelines; will help to prioritize focus on certain treatment populations (for example, if RT-ST combined is rare for some disease sites then will prioritize more common scenarios for discussion)

- **ESAS Symptom Burden Data**
  - By major disease site
  - Rationale: to inform and support expert decision-making

- **Literature**
  - Gather up to date any relevant literature from experts and share literature gathered for Systemic QBP
  - Rationale: to support and justify expert decision making

- **Caseload Reports**
  - If needed, experts can gather and share non-PHI caseload reports
  - Rationale: can help achieve consensus on clinical details such as # of minutes per visit for direct and indirect care provided

# RT QBP and PSO- high level timeline




Current status:

- Recruiting expert panel members (after RD/RVP approval)
- Refining decision-making approach, governance, etc.
- Gathering data to support decision-making (ESAS, treatment data, etc.)

# Next Steps & Action Items

# Funding Activities

- Identify and confirm cost drivers across disease sites (HR, infrastructure, supplies & minor equipment)
- Collect input from region for salaries for specified professions
- Review data collected with Working Group and Advisory Committee

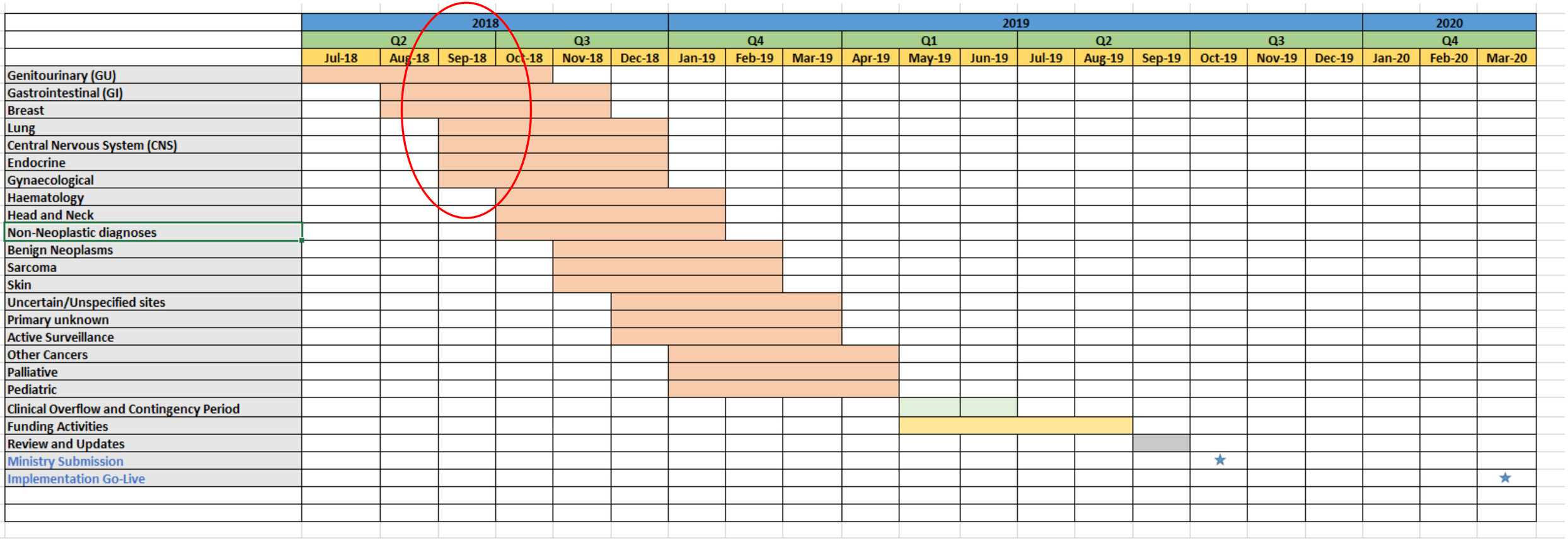
# Radiation Treatment Clinical Activities

- Confirm finalized GU protocols
- Confirm finalized GU quality metrics

# Action Items

- Provide any additional feedback on GU protocols and quality metrics

# Timelines



| | 2018 | | | | | | 2019 | | | | | | | | | | | | 2020 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Q2 | | | Q3 | | | Q4 | | | Q1 | | | Q2 | | | Q3 | | | Q4 | | |
| | Jul-18 | Aug-18 | Sep-18 | Oct-18 | Nov-18 | Dec-18 | Jan-19 | Feb-19 | Mar-19 | Apr-19 | May-19 | Jun-19 | Jul-19 | Aug-19 | Sep-19 | Oct-19 | Nov-19 | Dec-19 | Jan-20 | Feb-20 | Mar-20 |
| Genitourinary (GU) | | | | | | | | | | | | | | | | | | | | | |
| Gastrointestinal (GI) | | | | | | | | | | | | | | | | | | | | | |
| Breast | | | | | | | | | | | | | | | | | | | | | |
| Lung | | | | | | | | | | | | | | | | | | | | | |
| Central Nervous System (CNS) | | | | | | | | | | | | | | | | | | | | | |
| Endocrine | | | | | | | | | | | | | | | | | | | | | |
| Gynaecological | | | | | | | | | | | | | | | | | | | | | |
| Haematology | | | | | | | | | | | | | | | | | | | | | |
| Head and Neck | | | | | | | | | | | | | | | | | | | | | |
| Non-Neoplastic diagnoses | | | | | | | | | | | | | | | | | | | | | |
| Benign Neoplasms | | | | | | | | | | | | | | | | | | | | | |
| Sarcoma | | | | | | | | | | | | | | | | | | | | | |
| Skin | | | | | | | | | | | | | | | | | | | | | |
| Uncertain/Unspecified sites | | | | | | | | | | | | | | | | | | | | | |
| Primary unknown | | | | | | | | | | | | | | | | | | | | | |
| Active Surveillance | | | | | | | | | | | | | | | | | | | | | |
| Other Cancers | | | | | | | | | | | | | | | | | | | | | |
| Palliative | | | | | | | | | | | | | | | | | | | | | |
| Pediatric | | | | | | | | | | | | | | | | | | | | | |
| Clinical Overflow and Contingency Period | | | | | | | | | | | | | | | | | | | | | |
| Funding Activities | | | | | | | | | | | | | | | | | | | | | |
| Review and Updates | | | | | | | | | | | | | | | | | | | | | |
| Ministry Submission | | | | | | | | | | | | | | | | ★ | | | | | |
| Implementation Go-Live | | | | | | | | | | | | | | | | | | | | | ★ |

# Objectives for Today

## RT-QBP Advisory Committee meeting:

- To provide an introduction to Health System Funding Reform (HSFR) ✓
- To review GU RT-QBP protocols for consideration ✓
- To review GU RT-QBP quality metrics for consideration ✓
- To review the funding approach ✓
- To provide an update on Psychosocial Oncology (PSO) ✓
- Next steps and action items ✓